UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/579,026 | 05/10/2006 | Mats Stromblad | 09546-0028US1 55869 US SB | 3878 |

26211 7590 05/11/2011
FISH & RICHARDSON P.C. (NY)
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

| EXAMINER | |
|---|---|
| RUBY, TRAVIS C | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 3785 | |

| NOTIFICATION DATE | DELIVERY MODE |
|---|---|
| 05/11/2011 | ELECTRONIC |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/579,026 | STROMBLAD, MATS | |
| | Examiner | Art Unit | |
| | TRAVIS RUBY | 3785 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *15 March 2011*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *12 and 14-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *12 and 14-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 July 2010* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3/15/2011 has been entered.

### *Status of Claims*

2. The status of the claims as filed in the reply dated 3/15/2011 are as follows:

Claims 1-11 and 13 are canceled;

Claims 12 and 14- 22 are pending.

### *Claim Objections*

3. Claims 14-22 are objected to because of the following informalities: Each dependent claim recites "A device according to claim" which should be corrected to "The device according to claim" so as to provide proper antecedent basis for the claims. Appropriate correction is required.

### *Claim Rejections - 35 USC § 112*

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 12 and 14-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 12 recites the limitation in line 16 "a conduit" then in line 19 recites "a conduit portion". The phrasing of these limitations are confusing as it is not readily apparent as to what part of the conduit is the conduit portion or whether the conduit includes a second conduit portion that branches away from the primary conduit. More descriptive detail of the conduit portion is requested so as to avoid any ambiguity in determining the meaning of conduit portion.

Claim 12 also recites in line 19 "a conduit portion extending into and out of the outlet channel". This is misdescriptive of the applicants' invention as this limitation reads on just a single pipe that enters into the outlet channel and does not necessarily require that the conduit portion be a closed loop that prevents mixing of the fluids in the outlet channel. However, as can be seen in applicants' drawings the conduit portion of applicants' invention is a pipe with an inlet that extends into the outlet channel, reverses flow through a bend in the pipe, and then exits via an outlet pipe such that the fluid enters and leaves through separate inlet and outlet sections, while still staying contained inside the conduit portion and not mixing with the fluid in the outlet channel. Thus, the applicant is requested to amend the limitation to reflect the applicants' actual invention.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 12, 14-15, and 18-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dienhart et al (US6189334B1, previously of record) in view of Fuerschbach (US4815534, previously of record).

**Re Claim 12.** Dienhart et al discloses a heat exchanger device (11) includes a conduit extending into the inlet channel for the cooling agent to supply the cooling agent to the third porthole channel (15) and the second passages (17), and

wherein the conduit includes a conduit portion (20) extending into (21) and out (22) of the outlet channel (14) for the cooling agent such that heat exchange takes place between the cooling agent in the conduit portion and the cooling agent in the outlet channel (Figure 1 & 2), and

wherein the outlet channel for the cooling agent includes the fourth porthole channel (16) and a pipe (14) which extends outwardly from the fourth porthole channel and the plate package, wherein the conduit portion extends at least into and out of the pipe (Figure 2).

Dienhart et al. fails to specifically disclose that the heat transfer device is a plate heat exchanger.

Fuerschbach, however, teaches a heat transfer device comprising a plate heat exchanger (ref 10), wherein the plate heat exchanger includes a plate package of heat transfer plates, which are arranged to form between the plates first passages for a heat transfer medium to be cooled

and second passages for a cooling agent, wherein (Figure 2; Column 5 lines 46-49; Column 5 line 66 to Column 6 line 8):

the plate package includes a first porthole channel (ref 40a) and a second porthole channel (ref 40), which communicate with the first passages, and a third porthole channel (ref 41) and a fourth porthole channel (ref 41a), which communicate with the second passages (Figure 2; Column 5 line 46 to Column 6 line 8);

the first porthole channel (ref 40a) forms at least a part of an inlet channel to supply the heat transfer medium to the plate heat exchanger;

the second porthole channel (ref 40) forms at least a part of an outlet channel to discharge the heat transfer medium from the plate heat exchanger;

the third porthole channel (ref 41) forms at least a part of an inlet channel to supply the cooling agent to the plate heat exchanger;

the fourth porthole channel (ref 41a) forms at least a part of an outlet channel to discharge the cooling agent from the plate heat exchanger;

the heat exchanger device includes a conduit (ref IC) extending into the inlet channel for the cooling agent to supply the cooling agent to the third porthole channel and the second passages (Figure 2; It is obvious that an inlet conduit would be connected to the cooling medium inlet since some form of a pipe is necessary to transfer the cooling agent)

In view of Fuerschbachs' teaching, it would have been obvious to one of ordinary skill in the art at the time of invention to substitute a tube and fin heat exchanger for a plate heat exchanger as they are art recognized equivalents for the purpose of heat exchange between two fluids. In both cases, there are two inlets and two outlets for the two fluids to enter and exit out

of the heat exchanger so as to flow through the heat exchanger and exchange heat. In addition, the plate heat exchanger provides the advantage of being capable of being used as a liquid to liquid heat exchanger, which is known in the art to have improved heat exchange efficiency.

**Re Claim 14.** Dienhart et al. further teaches that the conduit portion extends into and out of the fourth porthole channel (16, Figure 2; Column 2 lines 52-58 teaches that the fourth channel 16 and the tube 14 can be formed integrally to one another, thus the conduit portion would extend into the fourth channel).

**Re Claim 15.** Dienhart et al. further teaches the conduit portion extends in a U-shaped path in the outlet channel (Figure 2, a portion of the conduit portion will flow in a U-shaped path).

**Re Claim 18.** Dienhart et al. further teaches the conduit portion (ref 20) extends in a path which is significantly longer than double the distance between an entrance position for the entrance of the conduit portion into the outlet channel and a position of the conduit portion located as far as possible from the entrance position (Figure 2; Column 2 line 59 to Column 3 line 6).

**Re Claim 19.** Dienhart et al. further teaches that the conduit portion extends in a helical-shaped path (ref 20) in the outlet channel (Figure 2; Column 2 line 59 to Column 3 line 6)

**Re Claim 20.** Dienhart et al. further teaches the conduit is included in a cooling agent circuit, which includes a compressor (10), a condenser (11), an expansion valve (12) and an evaporator (13) that includes the plate heat exchanger (Figure 1).

**Re Claim 21.** Dienhart et al. further teaches the conduit portion is located between the condenser and the expansion valve (Figure 1).

**Re Claim 22.** Dienhart et al. teaches a heat exchanger with two flow paths but fails to specifically teach that the two flow paths operate in a parallel or counterflow direction to one another. Fuerschbach, however, teaches that the inlet and outlet channels are arranged such that the heat transfer medium flows through the first passages in a counterflow direction or a parallel flow direction in relation to the cooling agent flow in the second passages (Figure 2; Column 5 line 46 to Column 6 line 8). In view of Fuerschbachs' teaching, it would have been obvious to one of ordinary skill in the art at the time of invention to select a preferred flow path in order to optimize the heat exchange efficiency of the system as is well known in the art.

8. Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dienhart et al. (US6189334B1, previously of record) in view of Fuerschbach (US4815534, previously of record) and in further view of Watanabe et al. (US6928833B2, previously of record).

**Re Claim 16 & 17.** Dienhart et al. as modified by Fuerschbach teaches the conduit extending into the heat exchanger but fails to teach that the conduit portion includes surface enlarging members including flanges, which are provided on the conduit portion and extend in the outlet channel. Watanabe et al., however, teaches that the conduit (ref 11) portion includes surface enlarging members including flanges (ref 13), which are provided on the conduit portion and extend in the outlet channel (Figure 1). In view of Watanabe et al.'s teachings, it would have been obvious to one of ordinary skill in the art at the time of invention to modify the conduit of Takao et al to include flanges, since this would increase the surface area of the conduit, and thus increase the heat transfer to the conduit, which is well known in the art to increase the efficiency of the refrigeration system.

### *Response to Arguments*

9. Applicant's arguments filed on March 15, 2011 with respect to claims 12 and 14-22 have been considered but are moot in view of the new ground(s) of rejection.

### *Conclusion*

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to TRAVIS RUBY whose telephone number is (571)270-5760. The examiner can normally be reached on Monday-Friday 9:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Swann can be reached on 571-272-7075. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Travis Ruby/
Examiner, Art Unit 3785

/Ljiljana (Lil) V. Ciric/
for Judy Swann, SPE of Art Unit 3785